

ATOMIC ENERGY *newsletter*®

A SERVICE FOR INDUSTRY BUSINESS ENGINEERING AND RESEARCH
ROBERT M. SHERMAN, EDITOR. PUBLISHED BI-WEEKLY BY ATOMIC ENERGY NEWS CO., 1000 SIXTH AVENUE, NEW YORK 18, N. Y.

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Dear Sir:

High-intensity pulsing reactor and associated facilities will be furnished by General Dynamics Corp. under recent \$2,400,000 Defense Department contract award. Supplier of the equipment will be GD's General Atomic division, San Diego, where a prototype of this reactor is now in operation. Contract calls for installation of the equipment at the new Armed Forces Radiobiology Research Institute, Naval Medical Center, Bethesda, Md. To be known as the DASA-Triga reactor, after the Defense Atomic Support Agency (DASA), sponsor of the Institute, peak pulsing capacity will be in the 2-million kw (thermal) range. (Other CONTRACT NEWS, p.2 this LETTER.)

Dutch nuclear instrument firm, Electronisch Kernfysisch Apparatenfabriek, N.V., has been acquired by Baird-Atomic, Inc., Cambridge, Mass., through purchase of majority of outstanding stock. The company, previously 100% owned by Bouvy-Zout, Holland, will now be known as Baird-Atomic Holland, N.V. EKAF, set up in 1959 to manufacture nuclear physics instruments, has production facilities at Hartogstrast 5A, The Hague, and staff which includes graduate physicists and engineers. BA will add some of its own instruments to those now produced by EKAF, and will produce a few (in which labor cost is a major factor) for the U.S. market. (Other BUSINESS NEWS, p.2 this LETTER.)

Conference concerned with the high temperature gas-cooled graphite moderated reactor (HTGR) is planned for January 17 and 18, 1961, in San Diego, under USAEC auspices; invitations will be sent by the Commission to holders of access permits. Research and development work conducted on this reactor will be described by staff of General Atomic division of General Dynamics Corp., who are designing and constructing it under cooperative agreement with the USAEC to which Philadelphia Electric Co. is a party. Cost of design and construction will be handled by Philadelphia Electric and some 51 other utilities comprising High Temperature Reactor Development Associates, Inc. Construction of the power plant, using this reactor, is planned at Peach Bottom, Pa., by Bechtel Corp., San Francisco. The GA prototype reactor will use fuel moderator elements containing enriched uranium and thorium carbide fuel in a graphite matrix, and will have power capacity of 40,000 kw.

Reduction in Canadian uranium production is reflected in October 1960 export figures which show \$18,301,000 worth of uranium concentrates exported; this is a decline of 26% from the \$24,774,000 worth exported in the same month in 1959. For the first ten months of 1960 uranium exports from Canada were valued at \$221,734,000; as compared with the \$255,397,000 exported during the comparable period in 1959 this was a fall off of some 13.2%. (Other PRODUCT NEWS, p.3 this LETTER.)

Option on 103 beryllium claims in Nevada has been acquired by Anaconda Co. from Mt. Wheeler Mines, Inc., firm owned by Jeremiah Millbank and the Herbert Hoover interests and others. Anaconda plans to do extensive underground work to determine the extent of the beryllium bearing zones. (Other RAW MATERIAL NEWS, p.4 this LETTER.)



ATOMIC ENERGY BUSINESS NEWS...NEW YORK UTILITIES FINANCE RESEARCH & DEVELOPMENT ON NUCLEAR POWER PLANTS:

Empire State Utility Power Resources Associates, a group of seven New York electric utilities, have decided after a year's study of the economics of nuclear power to finance two separate three-year research and development programs with two manufactures on advanced reactor concepts. The study, under direction of John R. Dunning, was concerned with nuclear power plants in the 300-500 electrical megawatt range. The two separate research and development programs that are outgrowth of this study look to possible plant construction in 1964 with completion by 1967-8. They will be handled by General Electric Co., on nuclear superheat, and General Dynamics Corp., on high temperature gas cooling. Under the GE phase of the program, a separate superheater reactor of about 15 thermal megawatts will be constructed at its Vallecitos, Calif., laboratory. The utilities have allocated \$5,750,000 and GE \$2,225,000 for this program, and USAEC financial assistance will also be sought. The General Dynamics program, handled by its General Atomic division, San Diego, Calif., is based on the development work carried on by GA for the 40 electrical megawatt prototype high temperature gas cooled reactor to be built at Peach Bottom, Pa., for Philadelphia Electric Co., in association with other utilities. Here the utilities will contribute \$4,500,000 and General Dynamics \$4,200,000. (Financing by the New York utilities will be through a newly formed non-profit research and development corporation: Empire State Atomic Development Associates, Inc. Contributions by the utilities will be 31% by Niagara-Mohawk; 17% by Long Island Lighting; 16% each by Consolidated Edison and New York State Gas & Electric; 9% by Rochester Gas & Electric; 6% by Central Hudson Gas & Electric; and 5% by Orange and Rockland Utilities.)

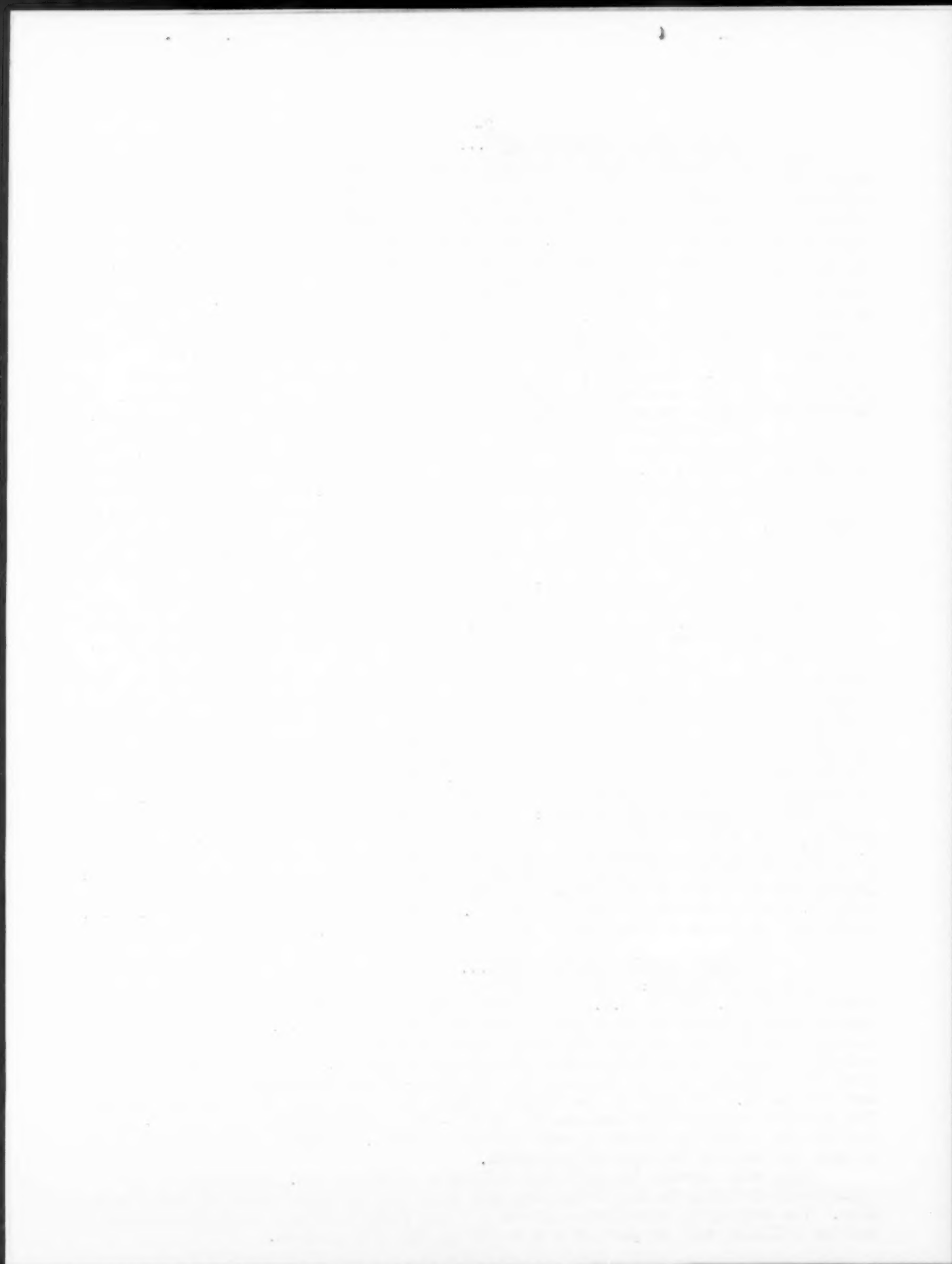
BRITISH FIRM LICENSED BY U.S. MANUFACTURER FOR REACTOR PRODUCTION: American Machine & Foundry Co. has licensed Pye Ltd., British electronics company, to manufacture and market AMF research and training nuclear reactors in the U.K. and Eire. Under terms of the contract, Pye will make available a series of AMF low power research reactors and related equipment as well as design and engineering service to U.K. universities, hospitals and research centers. The agreement also looks to eventual combined AMF-Pye activities in the nuclear field throughout the British Commonwealth (excluding Canada) and in Iraq, Jordan and Egypt. (AMF made an agreement with Pye in 1956 for the manufacture by the British company of AMF master-slave manipulators and for their sale to nuclear reactor centers. Since then, Pye has sold these devices in England, Australia, Austria, France, Germany, India, Italy and Switzerland.)

REACTOR IMPROVEMENTS CLAIMED: The prototype 50,000 electrical kw nuclear reactor which Allis-Chalmers will build for the USAEC (this LETTER, Nov. 22, 1960, p.1) will demonstrate improvements that A-C estimates would lower the cost of a 300 electrical megawatt station by some \$5,500,000 and increase its efficiency to 30.78%. The reactor will be a direct cycle, boiling water reactor with forced circulation, using 3.2% enriched uranium dioxide as fuel. Steam will be produced at 1250 p.s.i.g. which when used with a steam reheat cycle will give the 30.78% over-all efficiency.

ATOMIC ENERGY CONTRACT NEWS...

CONTRACTS AWARDED: Research contract has been awarded by the USAEC to Consumers Union, Mt. Vernon, N.Y., for partial support of studies of radioactivity in sample diets prepared in 25 cities in some 22 states in the U.S. The Commission will provide \$20,000 for the 1961 study which is a continuation of a 1959 survey made by Consumers Union independent of government support. In all of the cities, total diet samples will be analyzed for strontium-90 and naturally occurring calcium and radium-226. For some of the larger cities, the study will also include analyses for man-made radioisotopes cesium-137, cerium-144, plutonium-239, and zinc-65 as well as the naturally occurring radioisotope lead-210. Chemical analyses will also be made for natural isotopes of potassium.

Bids will shortly be evaluated by Holmes & Narver, Inc., Los Angeles, for exploratory drilling in the Bruinsburg salt dome some 40 miles south of Vicksburg, Miss. The company is architect-engineer for the USAEC's seismic research program, and the drilling will be part of a site survey for this program.



NEW PRODUCTS, PROCESSES, INSTRUMENTS...

PRODUCT NEWS: New type personal radiation monitor about the size of a fountain pen and weighing $3\frac{1}{2}$ -ounces has been developed by R. H. Dilworth and C. J. Borkowski of Oak Ridge National Laboratory's instrumentation and controls division. Using a Geiger counter as a radiation detector and a hearing aid earphone coupled to a resonant air column as the warning tone source, the device emits a warning tone and flashes a small neon lamp in the presence of a gamma radiation field. Proportional indication of radiation intensity is obtained over a range from natural background to 200 roentgens per hour, although normal range extends from background to one roentgen per hour. By inverting the device, range is automatically increased to 200 roentgens per hour. A quantity of the new instrument for use at the Laboratory is being procured from commercial manufacturers through competitive bidding.

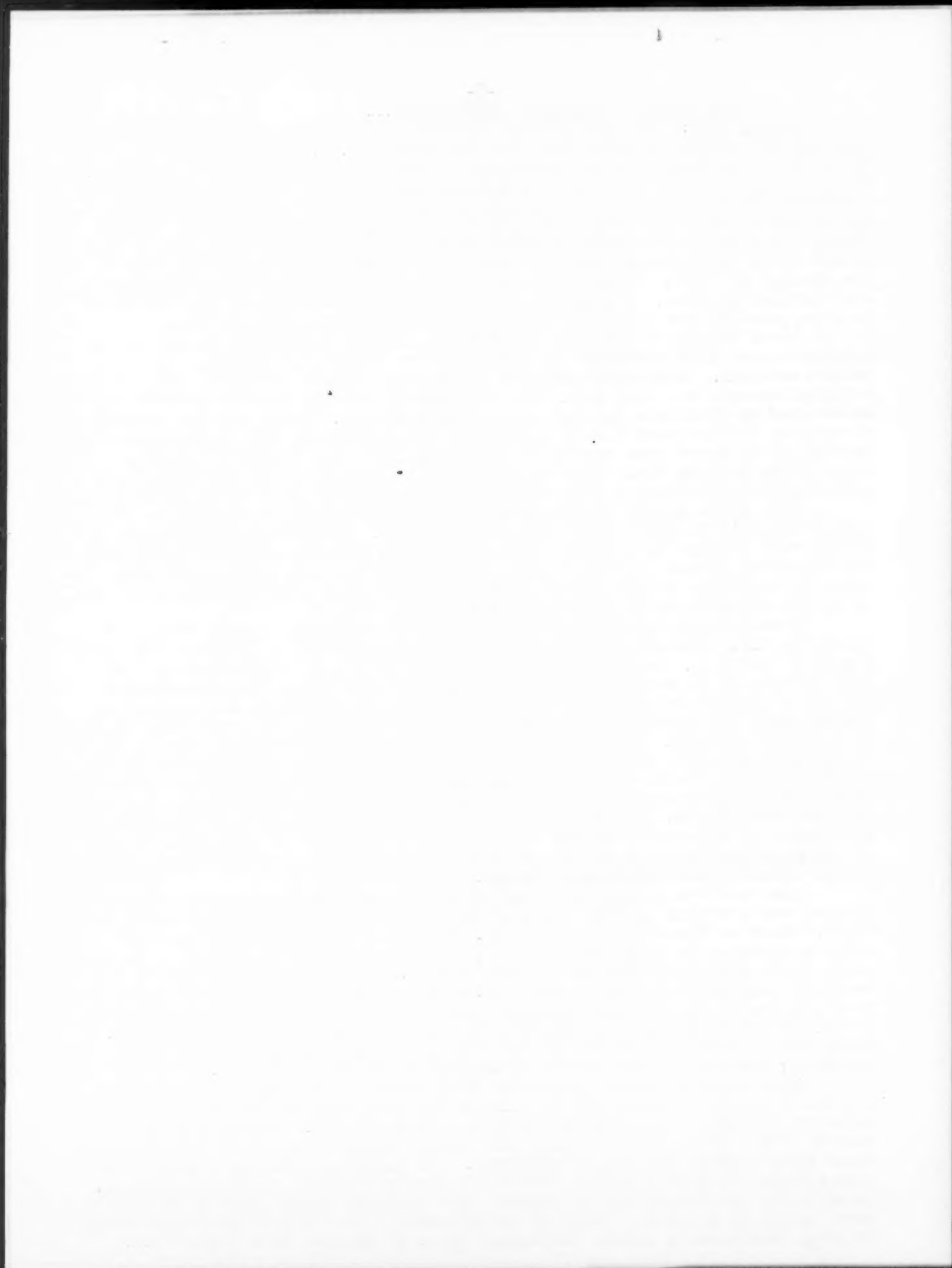
Use of tritium on the hands and dials of luminous watches and clocks will be permitted under USAEC amendment (10 CFR 30) of its regulations governing use of by-product material. Originally published for industry comment on July 2, 1960, three principal changes have been made. New requirements are that specific licenses must be obtained to distribute imported watches using tritium. Others are that methods of applying tritium paint must be approved by the Commission; that specific tests be carried out to ensure good bonding of the paint; etc. (The tritium is believed safer to use on watch dials than the conventional radium since its low energy beta particles cannot penetrate a watch crystal or the insensitive outer layer of the skin.)

Color coded nuclear fuel elements are now being supplied for pool-type reactors by Sylvania-Corning Nuclear Corp., Bayside, L.I. In addition to the color-coding, each element has a serial number engraved in the color-anodized side plates for individual element identification. It has been found that using a different color for each type of fuel element permits identification even when covered by 15 to 20 feet of water, as in pool-type reactors.

Microdosimeter developed by physicists of the radiation therapy service of the Bronx, N.Y., Veterans Administration hospital consists of a glass rod less than a quarter inch long. Encased in a miniature gold shield, it is placed within the body directly or in needles and in slender nylon tubes. After radiation exposure the rod is removed and exposed to ultraviolet light which creates an orange-yellow fluorescence. An electronic reader measures the color change which indicates degree of radiation exposure. Bernard Roswit, chief of the radiation therapy service at the Bronx VA hospital, has used the microdosimeter for cancer patients. Dr. Roswit noted that the ease with which the devices may be placed in almost any body location; their high degree of accuracy; and their low cost make them good dosimeters for medical and research use. He said that in all their clinical uses, there was a remarkable degree of correlation between the dosimeter reading and the calculated dosage of radiation from conventional x-rays, supervoltage radiation, cobalt-60 apparatus, radium implants, and radioisotope therapy.

Lower costs on production of hydrazine directly from ammonia using nuclear fission were predicted by John Cusack of Aerojet-General Nucleonics, San Ramon, Calif. Based on experimental results, Dr. Cusack said he believed the hydrazine could be produced for about 25¢ per pound; this compares with the company's 50¢ per pound figure given some time ago for this process. (Current cost when made by conventional chemical techniques is about \$1.65 per pound.) Aerojet has been using the pool type reactor at Livermore radiation laboratory in this experimental work which is part of a hydrazine program sponsored by the Air Force's Air Materiel Command. Operations at both high and low neutron flux in this experimental work have been scheduled; analysis of test results is expected by the end of January.

Small research reactor to provide short bursts of radiation for biomedical and health physics research will be built at Oak Ridge National Laboratory; with its associate equipment, estimated cost will be some \$1,400,000. The new Fast Burst Reactor (FBR), as it will be called, will consist mainly of a core of uranium molybdenum alloy without shielding or moderator. Its design provides for a pulse of 40 micro-seconds consisting of fast neutrons as free as possible of thermal neutrons. In addition, the reactor can be operated under constant, steady state conditions at power levels up to one kw. Staff of the Laboratory have designed the reactor which is being fabricated by Nuclear Development Corp. of America, White Plains, N.Y.



ATOMIC ENERGY FINANCIAL NEWS...

METALS FIRM EXPECTS HIGHER NET FOR 1960: Brush Beryllium Co. will have a net income for 1960 of about \$2 million, George Mikhailapov, president, said in New York last fortnight. Mr. Mikhailapov, who spoke before the New York Society of Security Analysts, based his estimate on fourth quarter net being about equal to the average net per quarter for the first nine months of this year. In 1959 Brush earned \$1,481,552. For the first nine months of 1960 earnings were \$1,511,110.

URANIUM CONCERN DECLARES FIRST DIVIDEND: First dividends will be declared by Faraday Uranium Mines, Canadian uranium producer. Shareholders of record Dec. 31, 1960 will receive two 7½¢ payments for a total of 15¢ per share on Jan. 25, 1961. The company hopes to maintain this dividend rate of 15¢ annually for the next several years. The company retired the last of its long term debts amounting to \$2,454,500 some three months ago. Its mill is now handling about 1,150 tons daily and mill heads are reported at the highest sustained level since the mine started in early 1957. For the past few months heads have averaged 2.2 lbs. of uranium oxide per ton and the company expects to maintain this grade throughout the remainder of its contract. Company officials note that so far as the ore situation is concerned there is enough in sight above the 600-ft. level to complete its \$45 million contract with Eldorado Mining & Refining. Because of the stretch-out policy governing uranium purchases by Eldorado, Faraday is maintaining production at about 66,000-lbs. of uranium oxide per month. On this basis, the company will fill its present contract by Sept. 1962.

SALES INCREASE REPORTED: Sales and net income for Technical Operations, Inc., reached new highs in the company's fiscal year ended Sept. 30, 1960 Frederick Henriques, president, told stockholders in the company's annual report. Consolidated sales increased 27% to \$4,285,000 while net income was \$119,200 or 26¢ per share. The company is active in nuclear physics programs and various phases of Defense Department work. As in previous years, the net income will be retained by the company for expansion purposes.

DIVIDEND DECLARED BY INSTRUMENT MANUFACTURER: Three per cent stock dividend has been declared by directors of High Voltage Engineering Corp., Burlington, Mass. It will be payable Jan. 27, 1961 to stockholders of record Dec. 30, 1960. The company has followed this policy previously, declaring a similar dividend in January, 1960.

MUTUAL FUND WITH NUCLEAR HOLDINGS SHOWS GAINS: Energy Fund, Inc., mutual fund holding stocks of companies in nuclear and other energy fields, increased its total assets some 64% during its fiscal year which ended Sept. 30, 1960, the company has reported. Net asset value per share including its 1960 capital gain distribution increased 11%, the Fund notes. For 1960 the rate of redemption was 14% of sales against the industry-wide mutual fund redemption rate of some 40%. Total net assets for the company Sept. 30, 1960 were \$12,225,001 with 622,100 shares outstanding. Among company holdings in the nuclear field are \$12,500 in convertible subordinated debentures of Nuclear Development Corp. of America, as well as 2,000 shares of stock in this company; some 6,600 shares of Rio Algom Mines; 1,000 shares of High Voltage Engineering Corp.; 1,500 shares of Radiation Dynamics, Inc.; and shares in instrument, reactor manufacturing, and associated firms.

STOCKHOLDING CHANGES MADE: Changes in stockholdings of officers of firms in the nuclear field include recent purchase by Evan T. Donaldson, vice president, of 100,300 shares of stock of Faraday Uranium Mines, Ltd. Mr. Donaldson increased his holdings through this purchase to 226,125 shares. Transactions in Nuclear Corp. of America include sale by Sam Norris, president, of 4,800 shares reducing his holdings to 45,200. The Martin Co., owner of 10% of stock, received on conversion of 4% debentures 244,828 shares increasing holdings to 1,017,994.

PEOPLE...in nuclear work...

Austin W. Betts will become director of the USAEC's division of military applications January 15, 1961. General Betts has been director of the advanced research project agency of the Defense Department since Dec. 1959.

Casper W. Ooms, Chicago attorney, will receive the USAEC's first citation for assistance in advancing the atomic energy programs of the Commission. Mr. Ooms has been member and Chairman of the Commission's patent compensation board since it was established in 1947.

ATOMIC ENERGY PATENT DIGEST...

PATENTS ISSUED December 6, 1960 to PRIVATE ORGANIZATIONS AND/OR INDIVIDUALS:

(1) Separation of uranium from zirconium-uranium alloy. Robert J. Teitel, inventor. No. 2,963,361 assigned to The Dow Chemical Co., Midland, Mich. (2) Methods and apparatus for detecting radioactive decay. Stanley A. Brosky, inventor. No. 2,963,581 issued to inventor of record. (3) Neutron production through alpha disintegration of carbon-13. Tom W. Bonner, Richard L. Caldwell, inventors. No. 2,963,582 assigned to Socony Mobil Oil Co., New York, N.Y. (4) Well logging apparatus. Maurice P. Lebourg, inventor. No. 2,963,583 assigned to Schlumberger Well Surveying Corp., Houston, Tex. (5) Pulse height analyzer. Jean M. Thayer, Robert E. Fearon, inventors. No. 2,963,584 assigned to Well Surveys, Inc. (6) Non-contacting thickness gauges. Roland C. Beeh, inventor. No. 2,963,585 assigned to Daystrom, Inc., Murray Hill, N.J. (7) Method of logging wells by induced delayed radiation. James A. Rickard, inventor. No. 2,963,586 assigned to Jersey Production Research Co., Tulsa, Okla. (8) Method of well logging. James A. Rickard, inventor. No. 2,963,587 assigned to Jersey Production Research Co., Tulsa, Okla. (9) Safety device for radiation level monitor systems. James A. Wilson, inventor. No. 2,963,588 assigned to Esso Research and Engineering Co. (10) Automatic ionization chamber. Henry V. Neher, Alan R. Johnston, inventors. No. 2,963,589 issued to inventors of record.

PATENTS ISSUED December 6, 1960 to GOVERNMENTAL ORGANIZATIONS: (1) Multiple input binary adder employing magnetic drum digital computing apparatus. Edmund H. Cooke-Yarborough, inventor. No. 2,963,223 assigned to USAEC.

PATENTS ISSUED December 13, 1960 to PRIVATE ORGANIZATIONS AND/OR INDIVIDUALS: (1) Recovery of uranium and vanadium values from ores. Morris Kolodney, Seymour C. Hyman, inventors. No. 2,964,390 assigned to Nuclear Development Corp. of America. (2) Recovery of lithium. Robert D. Goodenough, inventor. No. 2,964,381 assigned to The Dow Chemical Co., Midland, Mich. (3) Method for the production of zirconium boride. Helmut Espenschied, inventor. No. 2,964,398 assigned to National Lead Co., New York, N.Y. (4) Radiation source for density responsive apparatus. Philip E. Ohmart, inventor. No. 2,964,628 assigned to The Ohmart Corp., Cincinnati, Ohio. (5) Apparatus for continuously measuring the thickness of tubes during their manufacture. Julius Bosch, inventor. No. 2,964,630 assigned to Frieske und Hoepfner G.m.b.H., Bavaria, Germany. (6) Measuring system. George B. Foster, inventor. No. 2,964,631 assigned to Industrial Nucleonics Corp. (7) Coincidence-glow radiation detector. Herbert Friedman, Talbot A. Chubb, James E. Kupperian, Jr., inventors. No. 2,964,632 issued to inventors of record. (8) Back scatter thickness gauge. Stanley Bernstein, inventor. No. 2,964,633 assigned to General Electric Co., New York, N.Y. (9) Apparatus for producing neutrons. Sigmund P. Harris, inventor. No. 2,964,634 assigned to Tracerlab, Inc., Waltham, Mass.

PATENTS ISSUED December 13, 1960 to GOVERNMENTAL ORGANIZATIONS: (1) Separation of gases by diffusion. Rudolf E. Peierls, Franz E. Simon, Henry S. Arms, inventors. No. 2,964,124 assigned to USAEC. (2) Separation of ruthenium compounds from gaseous mixtures. Bill J. Newby, Darrell A. Hanson, Clyde E. May, inventors. No. 2,964,130 assigned to USAEC. (3) Accelerator target positioner and control circuit. Kenneth F. Stone, Robert J. Force, Wendell W. Olson, Duward S. Cagle, inventors. No. 2,964,710 assigned to USAEC.

NEW BOOKS & OTHER PUBLICATIONS...

Radiation Chemistry of Organic Compounds. A. J. Swallow. Useful reference for the research chemist. 380 pages. --Pergamon Press, London. (84s.)

The Isotope Index; 5th edition. Lists the source of every known commercially available isotope as of July, 1960, with more than 5500 items from some 50 U.S., Canadian, British, French and German suppliers. 144 pages. --Scientific Equipment Co., Indianapolis 19, Ind. (\$5.50)

MANUFACTURERS' LITERATURE: Manual No. 5, "Radiochemical Applications of the Membrane Filter", is available on request to Gelman Instrument Co., Chelsea, Mich.

Price List D of Bio-Rad Laboratories, Richmond, Calif., describes the complete line of this company's stable isotopes and stable-isotope labeled compounds. It may be obtained on request to the company.

Sincerely,

The Staff,
ATOMIC ENERGY NEWSLETTER